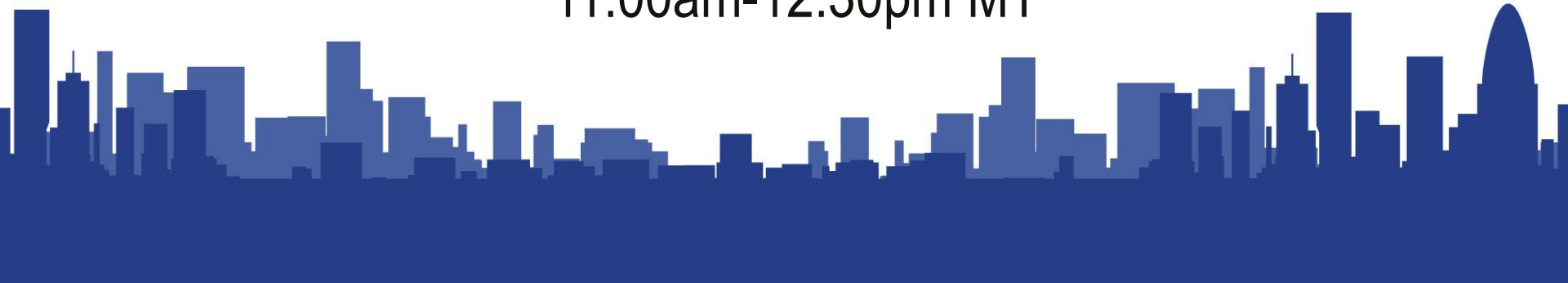




2013 Efficiency Forum - Sector Breakout I Healthcare Sector

May 29, 2013

11:00am-12:30pm MT



Agenda: Breakout Session I

- ❖ 11:00 Welcome and Introductions
- ❖ 11:15 New Technology Topics
- ❖ 11:30 AM Beaumont Health: Kaizens Approach
- University of Pittsburgh Medical Center:
 Retrocommissioning
- ❖ 12:00 Market Solutions Team Updates
- ❖ 12:10 BBA Opportunities/ Peer Exchange & Open Forum

Welcome Better Buildings Alliance Members!

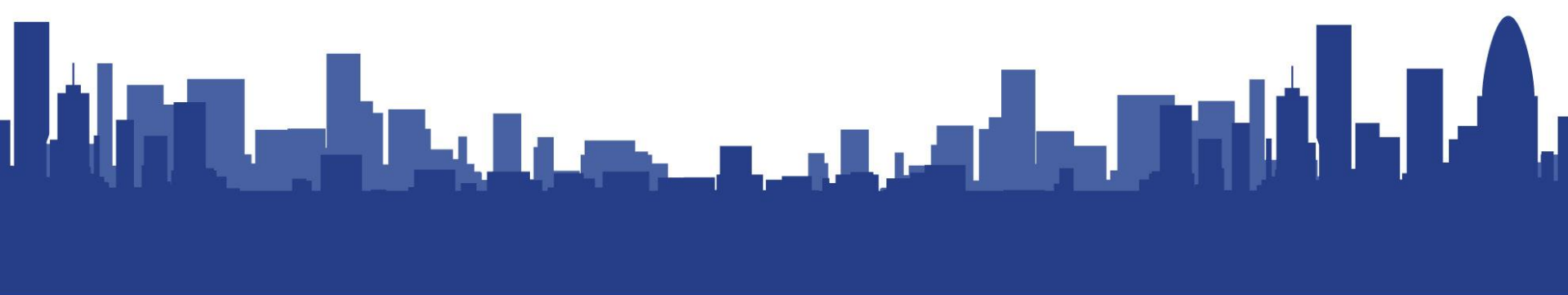
57 Member organizations from healthcare

4 Better Buildings Challenge partners

.8+ billion Square feet of building space
owned and managed



Interest in Establishing a Renewable Energy Project Team



Renewables Project Team

DOE is gauging interest in establishing a Renewables Project Team.

- ▶ Strategic use of renewables can help businesses reduce energy costs and environmental footprint
- ▶ A renewables project team can provide ***unbiased advice and shared experience*** to help BBA members navigate complex regulations, business models, and utility policies
- ▶ Who might be interested:
 - Anyone with large real estate holdings and/or high electricity costs
 - Businesses in areas with strong financial, utility, state, or other incentives for renewables
 - Organizations with sustainability goals
- ▶ Potential target technologies:
 - Solar PV, solar thermal systems and hybrid PV/Thermal
 - Biofuels and biogas
 - Small scale wind
 - Fuel cells?



Examples of Potential Projects

Solar Decision Guide and Support Services

- ▶ Businesses considering solar may encounter:
 - Widespread geographic differences regarding:
 - Utility Incentive structures (buy-down incentives, performance based incentives, Feed-in tariffs, etc.)
 - Utility policies (net metering, interconnection requirements)
 - Regulatory structures
 - Permitting requirements
 - Uncertainty about how to assess the different ownership structures (PPA, lease, own, etc.)
- ▶ The Solar Decision Guide and associated support services can help companies navigate this complex environment to determine if investing in solar makes financial sense and identify the regions that offer the most promising returns on solar investment.



Biogas Guide and Support Services

- ▶ Converting food waste to biogas can help supermarkets and foodservice establishments reduce energy and waste disposal costs

Key Questions

Before a renewables project team is established, we need to address several questions.

- ▶ Are members considering implementing renewables projects but struggling with certain issues associated with renewables? If so, what are the key concerns?
- ▶ Do members perceive significant value in establishing such a project team? Why?
- ▶ Which members would be interested in participating and/or leading such a team?
- ▶ What would be the priority issues to address?
 - Technologies: Solar PV, solar thermal systems and hybrid PV/Thermal, biofuels, other?
 - Regulatory issues
 - Utility incentives



Better Buildings Alliance Healthcare Sector & Steering Committee

- | | | | |
|---|--|--|---|
| <ul style="list-style-type: none"> ▪ A.O. Fox Memorial Hospital ▪ Adventist HealthCare ▪ Advocate Trinity Hospital ▪ American Society for Healthcare Engineering (ASHE) ▪ American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)* ▪ Ascension Health* ▪ Beaumont Health System ▪ Bon Secours St. Francis Health System ▪ Boulder Community Hospital ▪ Catholic Health Initiatives (CHI) ▪ CentraCare Health System ▪ Clarion Hospital ▪ Cleveland Clinic ▪ Dartmouth-Hitchcock Medical Center ▪ Dignity Health | <ul style="list-style-type: none"> ▪ Geisinger Health System ▪ Gundersen Lutheran Health System* ▪ Hackensack University Medical Center ▪ Health Care REIT ▪ Health Care Without Harm ▪ HealthSouth ▪ Hospital Corporation of America* ▪ IASIS Healthcare ▪ Illuminating Engineering Society of North America (IES) ▪ Inova Health System ▪ James J. Peters VA Medical Center ▪ Johns Hopkins Health System ▪ Kaiser Permanente ▪ Lake Health ▪ Legacy Health System ▪ Mayo Clinic | <ul style="list-style-type: none"> ▪ Metro Health Hospital ▪ New York-Presbyterian Hospital* ▪ North Shore-Long Island Jewish Health System ▪ Palomar Pomerado Health ▪ Partners HealthCare ▪ PeaceHealth ▪ Providence Health & Services ▪ Rush University Medical Center ▪ San Luis Valley Regional Medical Center ▪ Sinai Health System ▪ "Southwestern Vermont Health Care" ▪ St. Mary's Medical Center ▪ Summa Health System ▪ Texas Children's Hospital ▪ Texas Medical Center ▪ Central Heating and Cooling Services Corporation | <ul style="list-style-type: none"> ▪ (TECO) ▪ TRICARE Management Activity (TMA)* ▪ U.S. Department of Veterans Affairs ▪ University of Maryland Medical Center ▪ University of Pittsburgh Medical Center* ▪ University of South Alabama Medical Center ▪ Veterans Health Administration ▪ VHA Inc. ▪ West Chester Medical Center ▪ Yale-New Haven Hospital |
|---|--|--|---|

Bold = Better Buildings Challenge Partner
* = Steering Committee Member



Real value in a changing world

Beaumont® | HEALTH
SYSTEM

Engaging the Front Line in Energy and Water Conservation through Kaizen Methodology

Kay Winokur, RN, MSA

Vice President Quality, Safety and Accreditation

LEED Green Associate

Beaumont Health System

Tom Miroslaw, CEM, LEED GA

Vice President Energy and Sustainability Services

Jones Lang LaSalle



Beaumont Health System Campus

Royal Oak

- Beds — 1040 med/surg + 30 mental health = **1,070 licensed beds**
- Hospital square footages **2,173,509**
- Campus **3,142,384** (not including decks), parking decks **1,550,583**

Troy

- Beds — 406 med/surg current + 12 rehab on 12/31/12 = **418**
- Hospital square footages **805,599**
- Campus **1,625,634** (not including decks), parking decks **367,055**

Grosse Pointe

- Beds — 250 med/surg + 30 select specialty LTCH = **280**
- Hospital square footages **325,646**
- Campus **361,580** (not including decks), parking decks **148,000**

Creating the **Green** Infrastructure:

1. Develop a comprehensive plan
2. Partner with experts (HHI, HEA, JLL)
3. Involve stakeholders
4. Systematic communication
5. Position capital investments
6. Diligently measure and record all progress
7. Use Kaizen Methodology



Beaumont's **Green** and Sustainability Plan

- Indoor air quality
- Energy and water conservation
- Construction/remodeling according to green guidelines
- Grounds and environment
- Recycling and waste management
- Sustainable foods
- Composting plan
- Green business associates
- Information technology
- Education
- Quality process (audit, validation, certification)
- Communication/marketing

Strategic Plan

Healthier Hospitals Initiative

Healthier Hospitals INITIATIVE

Login Enroll Now Contact Search

About HHI HHI Challenges Get Involved Get Inspired Media Center Tools

Leading Communities to a Healthier Future

HHI has a real impact on the health and safety of patients, staff and communities

HHI CHALLENGES

- + Engaged Leadership
- + Healthier Food
- + Leaner Energy
- + Less Waste
- + Safer Chemicals
- + Smarter Purchasing

The Spark Blog

Archive

- 1 MAY** What is the right HHI Challenge for your Facility?
- 8 APR** On April 20, 2012, John Kendle had a heart attack.

News Updates

Archive

- 27 APR** Changes on the menu
- 24 APR** FIRST-EVER Healthier Hospitals Initiative's 2012 Milestone Report

6 Challenges

- Engaged leadership
 - Commitment to 10 leadership activities**Level 3**
- Healthier food
 - Reduce meat by 20% **Level 1**
 - Increase healthy beverages by 20% **Level 2**
 - Increase local/sustainable foods by 20% **Level 3**
- Leaner energy
 - Reduce energy by 3% **Level 1**
- Less waste
 - Achieve 15% recycling rate **Level 1**
- Safer chemicals
 - Healthy interiors (25%) **Level 1**
- Smarter purchasing
 - Surgical kit review **Level 1**



Strategic Priority

- Sustainability plan
- Sustainability executive owners
- Budget

Green & Sustainability Plan - 2013												
STRATEGY & SCHEDULE												
D = Design T = Test I = Implement C = Complete												
HHI 1: Engaged Leadership (level 3) - Kay, Nicole												
I.A	System Green Video Conf											
I.B	Communication progress to the board A) Annual Report B) Management Co.											
I.C	Share sustainability practices within the industry: A) Green Demonstration B) On Site Conf C) Case Studies											
I.D	Leaders to serve as spokesperson: A) MHA Committee B) MHA Conf, Clean Med - Geraldine (Healthy Interiors) C) Interiors Conf											
I.E	Include sustainability in Community Benefit Report (Send Forgotten Harvest, Gift Shops, World Relief) to Julie Kitchen											
I.F	Seek State & National Recognition (Corp mag, Free Press, UHC)											
I.G	Education - A) 500 CGO, B) 6 Town Halls, C) 12 blogs, D) LEED Class, 12 LEED Certif. (B current) Current CGO:											
I.H	Spread Green to offsite buildings (BBC - Carrie McGaughey; FSC - Robin, BHC - Suzanne Mattison, W Bloomfield - Jennifer)											
I.I	Site visits: Green Garage Lunches; MI Energy Options, Lansing (LEED O & M, Platinum)											
I.J	Develop patient info about green (electronic display or pt TV)											
I.K	Peds Grand Rounds (March 5, 8:30-9:30 am) - expert from Rainbow Babies Hospital											
I.L	Town Hall Schedule											
HHI 2: Healthier Food (level 3) and Garden - Maureen												
II.A	Decrease meat - Healthy Beverages											
II.B	Sustainable food purchasing (LEED MR, Credit 5)											
II.C	Establish Plan for Potential Organic Garden Sites (SO, IC, IC Walkway, No, Drs, Fitness, Employee Garden)											
II.D	Establish process for patients and children to garden (Occ & Rec Therapy, Child Time)											
HHI 3: Leaner Energy (level 1: 3%) - Clay and Glen												
III.A	Track Energy Star Rating: RO 20, GP 39, Troy 64, Energy Star R:											
III.B	LEED O & M Gap Analysis - Jasmine Davis											
III.C	Assess specs for renovation & new construction (LEED NGB Neuroscience - Jason Bell) - Kristine DeBus											
III.D	Develop plan (short or long term) for alternative energy (LEED EA, Credit 4)											
III.E	Participate in Hospital Energy Alliance (DOE) - Kay, Tom K, Clay, Tom Miroslaw											
III.F	Track metrics for Nalco chemical supplier - Clay											
III.G	Kaizen other buildings for energy/water opportunities (BHC, etc) - Clay, Rob, Rob, Ross											
III.H	2013 Energy Projects											
III.I	U of M Storm Water Management Landscape Project: Jake Hamilton (LEED SS, Credit 6)											
HHI 4: Less Waste (level 1) - Kris												
IV.A	Achieve 15% compared to total waste (LEED MR, Credit 7.50%) - Current:											
IV.B	Compost - Maureen											
IV.C	On site reuse room & process											
IV.D	Garage sales schedule quarterly - Mark Simmons											
IV.E	Amnesty day schedule monthly - Mark Simmons											
IV.F	Metal waste recycling - Pam B (OR/Autopsy)											
IV.G	Process for unused equipment - Centurion - Dan Zimba, Ken Hedgepath											
IV.H	Electronic metrics - R. Short											
HHI 5: Smarter Purchasing (level 1) - John H												
V.A	Surgical kits - (Pack utilization review - Dec 10, Jennifer W, Patty Cady) Goal 80%											
V.B	Reprocessing (Stryker - Jennifer W)											
V.C	EPANT - (Energy Star computers) - Rich Short											
V.D	Office Depot - metrics - Rob Tucker, Larry Cheaney, Carlos, Celia - current green and recycle spend is 26% (mostly toner cartridges) (LEED MR, Credit 1)											
V.E	Develop packet for hosting a green conference (menu, materials, recycle)											
HHI 6: Safer Chemicals (level 1) - Geraldine												
VI.A	Healthy Interiors - Geraldine (LEED MR, Credit 2 + 3) Goal 25%, current:											
VI.B	Green Cleaning - Kris (LEED HQ, Credit 3)											
VI.C	DEHP and PVC Reduction - John Harrois, Conf Call Rainbow Babies											
Alternative Commuting Transportation (LEED SS, Credit 4)												
VII.A	Complete Streets Plan, Woodward Action Group											
VII.B	MI Rideshare											
VII.C	Michvan Program											
VII.D	Expand number of cyclists (bike event, bike workshop, ride your bike to work day)											
VII.E	Charging stations											
VII.F	Preferred parking for carpools, # signed up											
VII.G	Transportation fair											
VII.H	Seek Bike friendly status: league of American cyclists Bike map											
VII.I	Grand Fondo - need funding											

Operational Focus

- Measurable sustainability objectives

Target Condition

1. Implement all **22** leadership activities — extended
2. Decrease meat purchases by 20% in 3 years. Target 2013: spend **\$1,319,176**
3. Increase healthy beverage purchases by 20% per year. Target 2013: **\$519,250**
4. Increase % of local/sustainable food by 20% per year or achieve local sustainable food purchases of 15%. (maintain — current **25%**)
5. HHI Goal 15%, achieved. Beaumont's goal: **35%**
6. Decrease energy use by **3%**
7. HHI Goal **25%**, achieved
8. Assess **80%** of surgical kits for waste

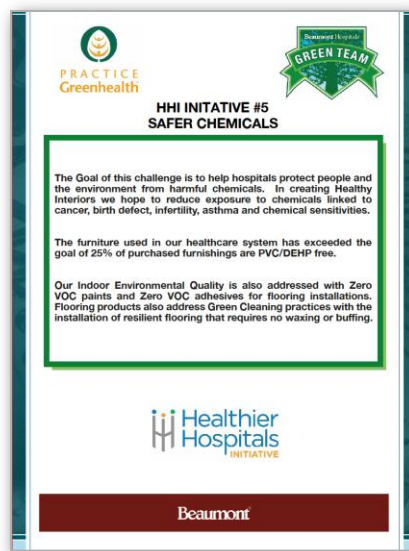
Stakeholder Engagement: Over 400 Green Officers

- 2-Hour certification training
- Job description
 - Educate and advocate for practices at Beaumont, consistent with the Beaumont plan.
 - Role model green behaviors
 - Use revolving doors
 - Use reusable mugs and bottles
 - Turn off lights
 - Power down computer and printers
 - Recycle paper, plastic, cardboard
 - Look for ways to reduce, reuse, and recycle goods
 - Look for ways to reduce water and power consumption
 - Share ideas with Green Team, share ideas on Green Blog
 - Recruit more green officers
 - Take green home



Stakeholder Engagement

- Education/engagement
 - HHI educational clings
 - Green officer certification
 - Employees, leaders & medical staff
 - Hospital orientation
- Share best practices in industry
 - Partnered with Jones Lang LaSalle to publish articles
 - Featured in HHI's monthly newsletter — *The Spark*



Use Kaizen Methodology

- Where does the word come from?
 - Japanese
 - Means “Improvement” or “change for the better” refers to philosophy or practices that focus upon continuous improvement of processes.
- At BHS Kaizen are used by employees to improve our ability to serve our patients.
- Kaizen Energy Conservation Teams look at areas to determine if energy can be saved.



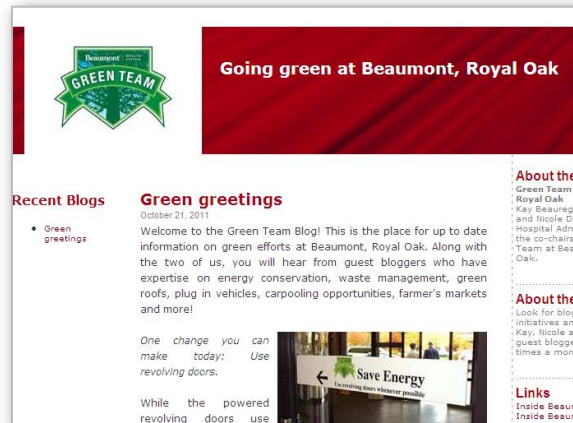
Partner with Experts:

Jones Lang LaSalle Energy and Sustainability Services

- Strategic Energy Program Manager
- Energy Assessments and Audits
- LEED EBOM Gap Assessment for Operations and Maintenance
- Sustainability Program Support
- Cross Account Collaboration

Systematic Communication

- Communicate progress to leadership
 - Board of trustees
 - Executive management committee
 - Organizational leadership & medical staff
- Annual Sustainability Report
- Provide feedback mechanism for sustainability initiatives
 - Green Blog
 - Green Officer town halls
 - Green website
 - Green Officer email blast



Position **Green** Capital Investments

- Infrastructure capital improvements must compete with the likes of medical equipment and technological advances for approval by not only hospital leadership, but by a physician review panel.
- Separated and highlighted all capital improvements with a green benefit, and provided detailed information on their return on investment in energy savings, and how much they could improve facility ENERGY STAR ratings.

Energy Projects & Energy Star

- **Energy saving projects**

- Capital projects with <2yr payback
- 55 projects in 2012

Energy Projects	2012
Energy Project Expense	\$922,099
Rebates	\$306,510
Full Year Energy Savings	\$2,138,063

- **Energy Star**

- 0–100 point rating scale
- Determines how effective you are compared to other hospitals that are also in Energy Star's system



	2011	2012
Royal Oak	15	23
Troy	55	62
Grosse Pointe	35	39

Win Awards

- As the saying goes, success breeds success
- Awards are invaluable in motivating staff and creating favorable impressions among patients and the larger community



Energy and Water Conservation Kaizens

- Team: Hospital Administrator, Plumber, Electrician, Energy Manager, IT, Project Manager
- Schedule
 - 2 days a month
 - January thru December
 - Different areas we looked at (not just energy)
 - Outside water, landscaping, biking, car pooling & walking paths
 - Roof
 - Mechanical equipment
 - Lighting
 - Inside water (bathroom, patient rooms, cafeteria)



Findings: Lighting

- Hallway lights were left on 24/7
- Turned off and put signs on switches
- Estimated savings \$15,983 per year



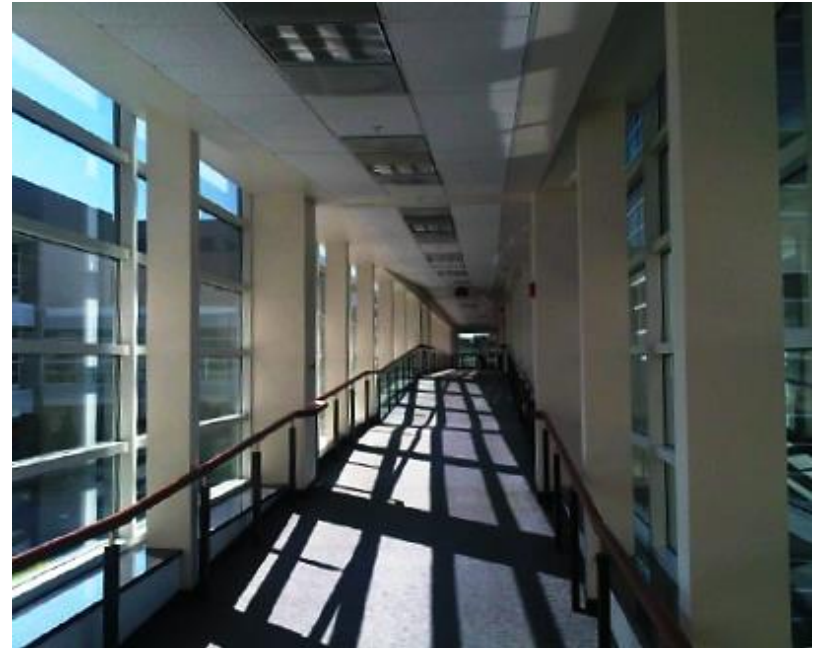
Drinking Fountains

- Drinking fountains did not need ice cold water
- Drinking fountains coolers were unplugged
- Estimated \$14,000 per year



Bridge Lighting

- Plenty of natural light available during the day
- Daylight harvesting sensors have been installed
- Estimated savings \$460 a year



Coffee Pots

- Coffeepots were left on 24/7
- Installed timers on 110 commercial-sized coffeepots
- Estimated saving \$34,000 a year



Improving Outdoor Landscaping Irrigation

- We were watering dead plants and rocks
- Other shaded areas were being over-irrigated
- Sprinklers were either redirected or cut back in usage to appropriate levels
- Estimated savings of 468,000 gallons per year



Green Facts in 2012

**Reduced CO₂
emission equals**



**3,248 cars
permanently
removed from roads**

**Saved water
equals**



**1,139 Americans'
annual water usage¹**

**Saved energy
equals**



**1,677 American
households' annual
electricity usage²**



**We also saved 16,247 trees and
3,767 cubic yards of landfill space in 2012.**



Today's Speakers

Kay Winokur



*LEED Green Associate
Vice President,
Quality & Professional Services*
Beaumont Health System

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Tom Miroslaw



*LEED GA; CEM
Vice President,
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Jones Lang LaSalle

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Tie Between Retro Commissioning and Energy Information systems

Drew Chidester

“Lotus” Formula One Race Car 1967





***“Mercedes” Benz 2012 F1
Race Car***



Retro- Commissioning

- Comparison of the buildings original design parameters and operational criteria with current design and operational requirements
- Identifies required system modifications to meet current mission

Retro-Commissioning goal

- To provide a safe environment to building occupants
- To reduce operation and maintenance costs

Energy Information Systems

- Building rounds (check sheets)
- Utility bills (excel spread sheet)
- Sub metering systems
- Steam plant control systems
- Chiller plant control systems
- Lighting control systems
- Building automated control systems
- Formal Energy Management system

Retro Commissioning and Energy Information Systems Ties

- Common Goals
 - Efficient and Safe Operation
- Data Acquisition
 - Historic and real time
 - Integration of existing subsystems
- Documentation
- Distillation of Data
 - Reports / Dashboards
- Problem Identification/ Performance Verification
 - Red light Green light
- Education

Caution and Advice

- Establish Long Range Objective and Short Term Goals
 - Establish stop points (funding issues)
- Keep it Simple
- Double Down
- Documentation
- Support
- Training

Market Solutions Overview

Key Market Solutions Activity Areas

▶ Overcoming the Split Incentive

▶ Financing

▶ Training & Workforce Development

▶ Data Access and Benchmarking

▶ Appraisals and Valuation

Business Case
Development

Coordination with
Project Teams

Dissemination of
Implementation Models

How Can the HEA Engage with the Market Solutions Team?

- ▶ Financing
 - Host a webinar to help disseminate the Ascension Health BBC Implementation Model
 - CFO white paper – provide feedback or CFO support
- ▶ Training and Workforce Development
 - DOE hosts building re-tuning trainings that promote more advanced usage of BAS systems
 - Was the re-tuning training useful and what other kinds of operational training do hospitals find helpful?
- ▶ Occupant Outreach and Engagement - Market Solutions has a session on tenant / occupant engagement at the forum (Day 1, Session 2)
- ▶ Data and Benchmarking - What barriers to benchmarking do hospitals encounter?

Opportunities/ Open Forum & Peer Exchange

- ▶ Opportunities
 - Highlight of current activities
 - “Tech Spec” host site opportunities
- ▶ Projects for Healthcare Sector – Open Discussion
- ▶ Feedback on BBA structure/communications, etc.



► Lighting and Electrical

- **Opportunity:** Lighting Energy Efficiency in Parking (LEEP) Campaign. Use roughly 1/3 less energy than current energy codes (ASHRAE Std 90.1-2010). Recognition, technical assistance.
- **Opportunity:**
 - Specification development: Troffers, exterior lighting, New! Wallpacks, Exterior Lighting Controls Guidance resource
- **Opportunity:** New adaptive exterior lighting technologies in healthcare facility

► Laboratories

- **Opportunity:**
 - Three best practices: optimizing minimum air-change rates, reducing simultaneous heating and cooling, and laboratory freezer energy management.
 - Sash management guide and resource kit – employ simple behavioral measures save energy.
 - Participate in efficient fume hood and ultra-low temperature freezer field testing.
- **Opportunity:** Commercial Kitchen Demand Control Ventilation (DCV) recorded presentation

Opportunities

▶ Space Conditioning

- **Opportunity:** Participate in development of best practices for duct leakage, standard AHU controls.

▶ Energy Management Information Systems (EMIS) Pilot project team:

- **Opportunity:** New group! Currently running EMIS (whole-building performance, tracking, monitoring, and analysis tools) pilot project. Outcomes to include: development of commonly-accepted classifications/ terminology for technologies, common energy and cost savings, best practices to achieve higher savings.

▶ Market Solutions

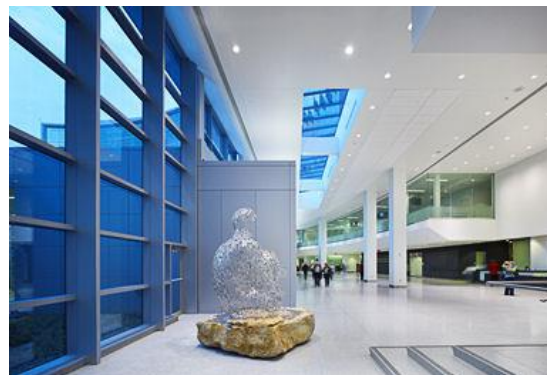
- **Opportunity:** Work with MS team to replicate successful strategies to overcome barriers identified in Better Buildings Challenge implementation models. The Better Buildings Challenge website is found [here](#).
- **Opportunity:** Workforce training - PNNL [online training](#) for re-tuning. Some in-person trainings.

The “Tech Spec” Demonstration-Host site Opportunity

DOE conducts field evaluations of products that meet the technical specifications to collect real world energy savings data. **We are looking for site hosts to participate!**

➤ What tech specs?

- New adaptive exterior lighting technologies in healthcare facility
- High efficiency troffer lighting
- Heat pump water heaters
- Laboratory fume hoods
- Ultra-low temperature freezers
- Distribution transformers
- Gas heaters
- High performance rooftop units



Cleveland Clinic OH

➤ Site hosts can receive:

- A discounted product, depending on the technology
- An energy audit of their current system
- A case study analyzing their building and the energy savings gained through upgrading to high efficiency product.

OPEN DISCUSSION

- ▶ Open Forum – ideas for future BBA Healthcare initiatives.
- ▶ What projects would assist what you are working on right now or in the future?
- ▶ From your activity with other organizations, is there an opportunity to assist with addressing industry barriers utilizing DOE, National Laboratory, and contractor staff.
- ▶ Topics for group calls aside from project teams.

Contact Information

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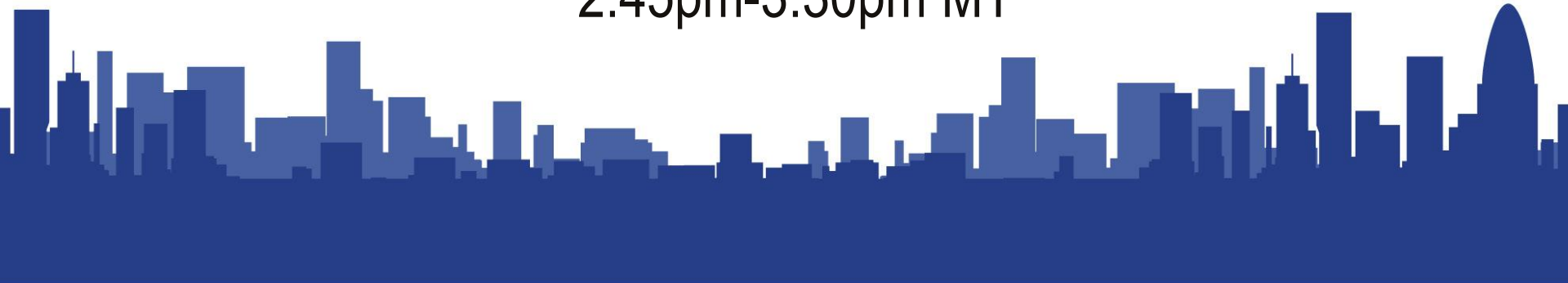
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2013 Efficiency Forum - Sector Breakout I Healthcare Sector

May 30, 2013

2:45pm-3:30pm MT



Agenda: Breakout Session I

❖ 2:45 PM

Discussion:

- Attendance to project team sessions
- Key activities
- Events

❖ 3:15 PM

Better Buildings Challenge Implementation Models Highlight Ascension Health

Project team session debriefs

- ▶ **Project Team sessions** – show of hands, who joined which session?
 - Lighting and Electrical
 - Space Conditioning
 - Refrigeration
 - Food Service
 - Energy Management & Information Systems
 - Market Solutions
 - Plug and Process Loads
 - Laboratories
- ▶ **Key Takeaways** – Any specific healthcare focused activities developed during any of the sessions?
- ▶ Proposed activities for next year?

Upcoming Event Attendance

- ▶ American Society for Healthcare Engineering (ASHE) Annual Conference, 50th Annual Conference & Technical Exhibition
— July 21-24, 2013.
- ▶ Others?

Better Buildings Challenge Implementation Models

▶ CORPORATE PARTNERS

- **ASCENSION HEALTH**
PLAYBOOK: FACILITIES INFRASTRUCTURE POOL
- **FOREST CITY ENTERPRISES** ▶
PLAYBOOK: ENTERPRISE-WIDE COORDINATION
- **HEI HOTELS & RESORTS**
PLAYBOOK: ENERGY LOOKING GLASS DASHBOARD
- **INTERCONTINENTAL HOTELS GROUP**
PLAYBOOK: INNOVATION HOTEL
- **KOHL'S DEPARTMENT STORES**
PLAYBOOK: ENERGY FINANCE STRATEGY
- **TIAA-CREF**
PLAYBOOK: DATA UPDATE AND CERTIFICATION SCORECARD

- **TRANSWESTERN** ▶
PLAYBOOK: GOOD, BETTER...BEST STANDARDS OF SUSTAINABILITY

EDUCATION PARTNERS

- **UNIVERSITY OF CALIFORNIA, IRVINE**
PLAYBOOK: DEVELOPING AN INTEGRATED "SMART LAB" PROGRAM

▶ INDUSTRIAL PARTNERS

- **3M**
PLAYBOOK: CAPITAL SET ASIDE FUND
- **ALCOA**
PLAYBOOK: LINKING ENERGY EFFICIENCY TO PERFORMANCE-BASED COMPENSATION
- **LEGRAND**
PLAYBOOK: SUBMETERING INITIATIVE AND ENERGY DASHBOARDS

STATE AND MUNICIPAL PARTNERS

- **CITY OF ATLANTA**
PLAYBOOK: PUBLIC-PRIVATE PARTNERSHIP
- **DISTRICT OF COLUMBIA**
PLAYBOOK: COMMUNITY ENGAGEMENT
- **CITY OF HOUSTON**
PLAYBOOK: COMMUNITY OUTREACH
- **CITY OF LOS ANGELES**
PLAYBOOK: PUBLIC-PRIVATE PARTNERSHIP
- **CITY OF PITTSBURGH**
PLAYBOOK: GREEN INITIATIVES TRUST FUND
- **STATE OF NORTH CAROLINA**
PLAYBOOK: UTILITY SAVINGS INITIATIVE

THANK YOU!

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